What is claimed is:

1. A probe for measuring the surface temperature of a pipe, the probe comprising:

a detector assembly including

a rigid, unitary clamp member having a bottom, pipe engagement surface, an oppositely disposed upper surface, and first and second locking dogs extending upwardly from the upper surface defining a gap having a width W_G therebetween, and

a temperature sensor assembly carried on the pipe engagement surface; and

a strap having a rectangular shape and extending longitudinally from a proximal end portion to a distal end portion, the proximal end portion being mounted to the clamp member, the strap being flexible and longitudinally resilient and having a thickness T_U in an unstretched condition and a thickness T_S in a stretched condition, where $T_U > T_S$, $T_U > W_G$, and $W_G > T_S$;

wherein the probe is mounted to the pipe for measuring the temperature of the pipe by positioning the pipe engagement surface of the clamp member against the pipe, wrapping the strap around the pipe, applying a tensile force to the distal end portion of the strap, whereby the thickness of the strap decreases from T_U to T_S, positioning the strap in the gap between the first and second locking dogs, and removing the tensile force, whereby a segment of the strap disposed between the first and second locking dogs expands to a thickness substantially equal to W_G to clamp the strap between the first and second locking dogs.

2. The probe of claim 1 wherein the strap is composed of an elastically deformable material.

3. The probe of claim 1 wherein the clamp member is composed of a polymeric material.

4. The probe of claim 1 wherein the clamp member also has oppositely disposed first and second sides and the pipe engagement surface of the clamp member has an arcuate shape, defining a groove extending laterally from the first side of the clamp member to the second side of the clamp member.

5. The probe of claim 4 wherein the pipe engagement surface has a recess, the temperature sensor assembly being mounted in the recess.

6. The probe of claim 5 wherein the temperature sensor assembly includes:

a resilient member disposed within the recess and mounted to the pipe engagement surface;

a sensor subassembly mounted to the resilient member and extending from the recess; and

a signal carrying conductor extending from the sensor subassembly and through a port in a one of the sides of the clamp member.

7. The probe of claim 6 wherein the signal carrying conductor has a proximal portion extending from the side of the clamp member and the detector assembly also includes a sleeve disposed around the proximal

portion of the signal carrying conductor, the sleeve having an end portion mounted to or engaged by the clamp member.

8. The probe of claim 6 wherein the sensor subassembly comprises a thermistor mounted between inner and outer heat transfer elements.

9. The probe of claim 6 wherein the sensor subassembly comprises a thermocouple.

10. The probe of claim 1 wherein the clamp member also has oppositely disposed front and rear surfaces and a strap mount extending laterally from the rear surface, the proximal end portion of the strap being mounted to the strap mount.

11. The probe of claim 10 wherein the strap mount includes a substantially planar member defining first and second substantially identical, longitudinally extending slots forming a bar therebetween, the strap extending from the distal end portion upwardly through the first slot, wrapping around the bar and extending downwardly through the second slot to the proximal end portion.

12. The probe of claim 11 wherein the first and second slots each has a width W_{SL}, where $W_{SL} > T_U$ and $W_{SL} < 2T_U$, and the proximal end portion of the strap is formed in a loop, whereby the strap is removable from the strap mount by applying a tensile force to the proximal end portion and the looped proximal end portion prevents the strap from being drawn though the strap mount when a tensile force is applied to the distal end portion.

13. The probe of claim 12 wherein $W_{SL} < 2T_S$.

14. The probe of claim 10 wherein the clamp member further has oppositely disposed first and second sides and a pair of indexing tabs extending laterally from the front surface proximate to each side, the indexing tabs aligning the strap with the gap between the first and second locking dogs when the probe is mounted to the pipe.

15. The probe of claim 1 wherein each of the locking dogs has a triangular-shape and an inner wall, the inner walls defining a V-shaped strap-receiving channel, the inner walls of the locking dogs engaging the strap and the V-shape of the strap-receiving channel longitudinally folding a segment of the strap as the strap is positioned in the gap between the locking dogs

16. The probe of claim 15 wherein each of the locking dogs has a vertically-extending inner corner, the inner corners of the locking dogs defining the gap, wherein $2T_U > W_G > 2T_S$.

17. The probe of claim 16 wherein each of the inner corners of the locking dogs has a narrow blade shape, extending rearwardly and laterally inward into the strap-receiving channel.

18. A probe for measuring the surface temperature of a pipe, the probe comprising:

a detector assembly including

a rigid, unitary clamp member having a bottom, pipe engagement surface, an oppositely disposed upper surface, oppositely disposed first and second sides, oppositely disposed front and rear surfaces, a strap mount extending laterally from the rear surface, and first and second locking dogs extending upwardly from the upper surface defining a gap having a width W_G therebetween, and

a temperature sensor assembly carried on the pipe engagement surface; and

a strap having a rectangular shape and extending longitudinally from a proximal end portion to a distal end portion, the proximal end portion being mounted to the strap mount, the strap being flexible and longitudinally resilient and having a thickness T_U in an unstretched condition and a thickness T_S in a stretched condition, where $T_U > T_S$, $T_U > W_G$, and $W_G > T_S$;

wherein the probe is mounted to the pipe for measuring the temperature of the pipe by positioning the pipe engagement surface of the clamp member against the pipe, wrapping the strap around the pipe, applying a tensile force to the distal end portion of the strap, whereby the thickness of the strap decreases from T_U to T_S, positioning the strap in the gap between the first and second locking dogs, and removing the tensile force, whereby a segment of the strap disposed between the first and second locking dogs expands to a thickness substantially equal to W_G to clamp the strap between the first and second locking dogs.

19. The probe of claim 18 wherein the pipe engagement surface has a recess and the temperature sensor assembly includes:

a resilient member disposed within the recess and mounted to the pipe engagement surface;

a sensor subassembly mounted to the resilient member and extending from the recess; and

a signal carrying conductor extending from the sensor subassembly and through a port in a one of the sides of the clamp member.

20. The probe of claim 18 wherein the proximal end portion of the strap is formed in a loop and the strap mount defines at least one longitudinally extending slot having a width W_{SL}, where $W_{SL} > T_U$ and $W_{SL} < 2T_U$, the strap extending from the distal end portion through the slot to the proximal end portion, whereby the strap is removable from the strap mount by applying a tensile force to the proximal end portion and the looped proximal end portion prevents the strap from being drawn though the strap mount when a tensile force is applied to the distal end portion.

21. The probe of claim 18 wherein each of the locking dogs has an inner wall extending from a vertically-extending, inner corner disposed proximate to the rear surface to a vertically-extending, outer corner disposed proximate to the front surface, the inner corners of the locking dogs defining the gap, the inner walls engaging the strap and longitudinally folding a segment of the strap as the strap is positioned in the gap between the locking dogs, wherein $2T_U > W_G > 2T_S$.